SEP 1993

H
W N
WAGNER, HEINDEL, and NOYES, Inc.
• Consulting Hydrogeologists
• Engineers
• Environmental Scientists
P.O. Box 1629 Burlington, Vermont 05402-1629
802-658-0820
FAX: 802-860-1014

September 27, 1993

Mr. Chuck Schwer
Supervisor, Sites Management Section
Hazardous Materials Management Division
Agency of Natural Resources
103 South Main Street/West Building
Waterbury, VT 05671-0404

Re: South Burlington Police Department (Site #93-1384)

Dear Chuck:

Attached is the Site Investigation Report for the above-referenced site. The Site Investigation Report for Site #93-1383 (South Burlington Street Department/Patchen Road) will be forwarded to you shortly.

We look forward to hearing from you following your review of this material. If you have any further questions, please contact either Jeff Noyes or myself.

Sincerely,

Rebecca Lane for

Michele Christopher, REM #5773
Environmental Engineer

MC/ew

cc: Mr. Charles Hafter. City Manager of South Burlington

Attachments

[L-SCHWER/MC 7-17-93]

WAGNER, HEINDEL, and NOYES, Inc.

- Consulting Hydrogeologists
- Engineers
- Environmental Scientists

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THE SOUTH BURLINGTON POLICE DEPARTMENT
575 Dorset Street
South Burlington, Vermont

UNDERGROUND STORAGE TANK
SITE INVESTIGATION
SITE NO. 93-1384

Prepared for:
City of South Burlington

Prepared by:

Rebecca Lane for

Michele Christopher, REM #5773
Environmental Engineer

Reviewed and Approved by:

Jeffrey E. Noyes
Principal

September 27, 1993

THE SOUTH BURLINGTON POLICE DEPARTMENT
575 Dorset Street
South Burlington, Vermont

UNDERGROUND STORAGE TANK SITE INVESTIGATION
SITE NO. 93-1384

TABLE OF CONTENTS

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THE SOUTH BURLINGTON POLICE DEPARTMENT
575 Dorset Street
South Burlington, Vermont

UNDERGROUND STORAGE TANK SITE INVESTIGATION
SITE NO. 93-1384

EXECUTIVE SUMMARY

- On April 29, 1993, a 3,000 gallon gasoline underground storage tank was removed from the South Burlington Fire Department parking lot at 575 Dorset Street in South Burlington, Vermont. The tank had been used by the South Burlington Police Department but has been out of service for a year.

- Following the removal of this UST, the tank removal inspector reported a petroleum release to the subsurface. The State Sites Management Section (SMS) responded to the City of South Burlington requiring them to retain environmental consultants to ascertain the extent of subsurface contamination.

- Wagner, Heindel, and Noyes, Inc. (WH&N) oversaw the installation of three carefully placed monitoring wells by Tri-State Drilling and Boring. Groundwater samples from these wells tested negative for all benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds, indicating that the observed subsurface contamination had not impacted groundwater yet.

- Groundwater flows to the south/southeast towards Potash Brook.

- Chief Goddette of the South Burlington Fire Department confirmed that all the buildings in the vicinity are constructed slab on grade, and are supplied by municipal water and sewer. Based upon his knowledge of the area, we do not believe that there are any sensitive receptors in the immediate vicinity of the site.

- The groundwater analytical results and sensitive receptor survey results indicate that groundwater has not yet been impacted.

- In order to determine if soils in the vadose zone have been contaminated, as was reported following the tank removal, WH&N recommends that soil gases be extracted and analyzed insitu with a field PID. We also suggest that the "head" space from groundwater samples be periodically field tested with a PID/FID to monitor for potential contamination migration.

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THE SOUTH BURLINGTON POLICE DEPARTMENT
575 Dorset Street
South Burlington, Vermont

UNDERGROUND STORAGE TANK SITE INVESTIGATION
SITE NO. 93-1384

1.0 OVERVIEW

Company performing work: Wagner, Heindel, and Noyes, Inc.
P.O. Box 1629
Burlington, VT 05402-1629
Phone: 802-658-0820
Fax: 802-860-1014

Site owner: City of South Burlington

Contact: Charles Hafter, South Burlington City Manager
575 Dorset Street
South Burlington, VT 05403
Phone: (802) 658-7953

Tank owner/operator: South Burlington Police Department
Contact: Lt. Jon Kruger
Phone: 802-658-7971

Rationale for site investigation:

This site investigation is being performed in response to a reported release of gasoline to the subsurface following the removal of a gasoline underground storage tank (UST). The subject tank was a single 3,000-gallon gasoline underground storage tank which was removed from the South Burlington Fire Department parking lot at 575 Dorset Street in South Burlington on April 29, 1993. The tank had been utilized by the South Burlington Policy Department but was reportedly out of service for approximately one year prior to

its removal. This gasoline UST had been installed in 1981 to replace a tank which had been installed in 1972. The scope of this investigation involved the installation of three monitoring wells in order to evaluate the degree and extent of groundwater and soil contamination, a preliminary receptor assessment to determine the potential for impact to nearby receptors, and a summary report which includes well logs, analytical and soil screening results, a site map with groundwater contours, as well as conclusions and recommendations.

State notification made:

Both the State and local authorities were notified of the petroleum release by the tank pull inspector, Peter M. Murray, Hydrogeologist for Griffin International, Inc. The State Site Management Section responded to Mr. Charles Hafter, South Burlington City Manager, with the request for this site investigation.

2.0 SETTING AND LAYOUT

Site address: Parking lot of South Burlington Fire Department located at 575 Dorset Street, South Burlington, Vermont.

The reported petroleum release observed following the removal of a single 3,000-gallon gasoline UST on April 29, 1993 was located on a portion of the parking lot for the South Burlington Municipal Complex (specifically, the Fire Department) at 575 Dorset Street in South Burlington, Vermont. Appendix 1, page 1, presents a 1" = 50' site map depicting the location of the former UST site, the locations of the newly installed monitoring wells (MW-1, MW-2, and MW-3), the direction of groundwater flow, the location of pavement, and the location of the adjacent South Burlington Fire Department. Appendix 1, page 2, presents the USGS topographic map for the region. The study area is essentially flat. Groundwater flow is directed to the south/southeast towards Potash Brook.

The Soil Conservation Service (SCS) Chittenden County soil map for the area describes the soils as primarily Duane and Deerfield series soils. These soils are characterized as deep, very friable, rapidly permeable, moderately well drained, and sandy throughout their profile.

Soil boring logs for the three monitoring wells we installed on the property are found in Appendix 2. These logs confirm that the first 12 feet of soils consists primarily of fine sands. At 12-17 feet (±), a gray clayey silt/silty clay was observed in all borings. This stratigraphy is consistent with subsurface conditions observed at other locations along Dorset Street.

A photoionization detector (PID) ground survey was conducted on the site, and all volatile organic compounds (VOCs) concentrations were found to be at background levels. Chief Goddette of the South Burlington Fire Department was interviewed in order to determine the potential locations for sensitive receptors. Chief Goddette confirmed that all buildings in the surrounding area are constructed slab on grade; none of the buildings have basements until approximately one-half mile north on Dorset Street on Sherry Road (Appendix 1, page 2). Chief Goddette confirmed that all buildings, homes, and apartments in the area are supplied by municipal water and sewer. There are no domestic or commercial water supplies in the area that he is aware of.

3.0 SITE HISTORY

The 3,000-gallon gasoline UST which was removed on April 29, 1993 had been installed in 1981. This tank reportedly replaced a previously existing gasoline tank which had been installed in 1972. Documentation regarding its removal in 1981 is not available.

Peter Murray, Hydrogeologist with Griffin International, inspected the tank removal on April 29, 1993. He noted that the tank appeared to be in good condition, with no leaks or pits observed. Mr. Murray further hypothesized that the release of gasoline to the subsurface was due either to a leak in the original tank (which had been installed in 1972) or from the piping which runs from the former UST to the pump. Contamination was not observed during the installation of the three monitoring wells on July 21, 1993.

4.0 INITIAL SAMPLING AND SCREENING OF SOILS AND GROUNDWATER FOR PETROLEUM HYDROCARBONS

The City of South Burlington was requested to retain the services of an environmental consultant to further define the degree and extent of contamination in the vicinity of the former UST site in a letter from the Sites Management Section (SMS) to the City of South

Burlington, dated June 4, 1993. The SMS suggested that this determination be instituted through the installation of three properly located monitoring wells. SMS also requested that groundwater be analyzed via EPA Method 8020, soil samples be obtained using a split-spoon sampling device, and that soils be screened using a PID.

Following approval of a work plan prepared by WH&N, additional subsurface activities commenced. After obtaining Dig-Safe clearance, three monitor wells (MW-1, MW-2, and MW-3) were installed by Tri-State Boring under the supervision of WH&N on July 21 and July 22, 1993. Driller's boring logs and WH&N boring logs are provided in Appendix 2, pages 1-9. Rain prevented the effective use of the PID to determine the presence of volatile organic compounds for monitoring wells MW-1 and MW-2, with the exception of soil sample #5 for each of these two wells. Soil samples had no noticeable petroleum odor. Soil from split-spoon sample #5 was bagged, and the head space was analyzed for VOCs. The PID yielded 0.0 ppm for both MW-1 and MW-2. Rain was not a problem during the installation of MW-3 and the PID was utilized continually. MW-3 yielded PID readings of 0.0 ppm for all split-spoon samples.

Two-inch diameter, flush-threaded PVC wells with factory-slotted 0.020-inch screens were used for monitoring wells. All three wells have a total depth of 15 feet below the ground surface (bgs), with the screen situated at 15 feet to 5 feet bgs. The screened section is covered with filter sock, and a surrounding sand pack was installed from 15 feet to 3.5 feet bgs, with a bentonite plug from 3.5 feet to 1.5 feet bgs. Native soil was used to fill to 1 foot bgs, and a 6-inch flush-mounted well guard was installed.

Water levels were permitted to equilibrate in each well and were then recorded and used, along with survey data, to construct a water table map (Appendix 1, page 1). The contour map shows a general groundwater flow direction towards the south/southeast.

Groundwater samples were analyzed using EPA Method 8020. The results from this analysis are presented in Appendix 3. All analytes were found to be present in non-detect levels with no unidentified peaks observed.

5.0 INITIAL RISK EVALUATION

Chief Goddette of the South Burlington Fire Department was interviewed in order to determine potential locations for sensitive receptors. Chief Goddette confirmed that all

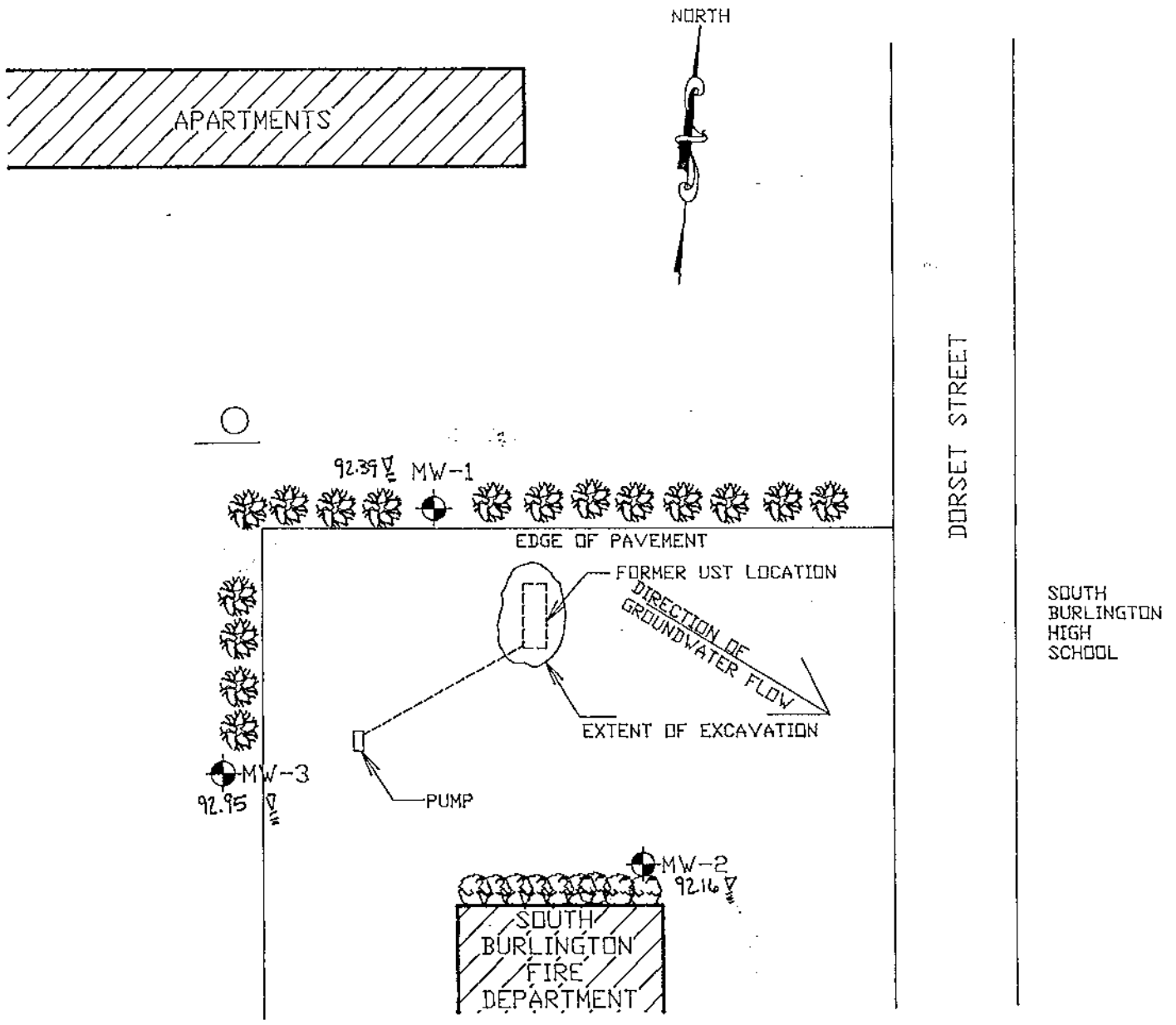
buildings in the surrounding area were constructed slab on grade. None of the surrounding buildings have basements until approximately one-half mile upgradient at Sherry Road. Chief Goddette also confirmed that all the buildings and homes and apartments in the area are supplied by municipal water and sewer. There were no wells in the area that he is aware of.

A PID survey of the area around the tank site was performed on the property on July 22, 1993. All readings were found to be at background levels of 0.0 ppm.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The analytical results and sensitive receptor survey results indicate that the contamination observed during the tank removal has not yet impacted groundwater in the vicinity of the three newly-installed monitoring wells. In order to determine whether the soils in the vadose zone have been impacted, WH&N recommends that the soil gasses in the area of the tank be extracted with a blower and tested in the field with a PID. This test would allow us to sample at least one pore volume of air from the entire excavation. If significant PID readings are detected in any of the wells, this would indicate that there is a zone of contamination not specifically identified by the boring program. Periodic testing of "head" space from groundwater samples is also suggested. If positive readings are indicated, samples would be submitted to the lab for quantitative analysis.

[RPT-SBPOLICE/MC 8-23-93]



WELL #	ELEV. TOP OF CASING	DEPTH TO GRD. WATER	ELEV. OF GRD. WATER
MW-1	101.34'	8.95'	92.39'
MW-2	100.98'	8.82'	92.16'
MW-3	100.00'	7.05'	92.95'

C:\SBTOWN\TANKPULL.DWG

Wagner, Heindel, and Noyes

CONSULTING SCIENTISTS AND ENGINEERS

• Hydrogeology • Ecology •

• Environmental Engineering •

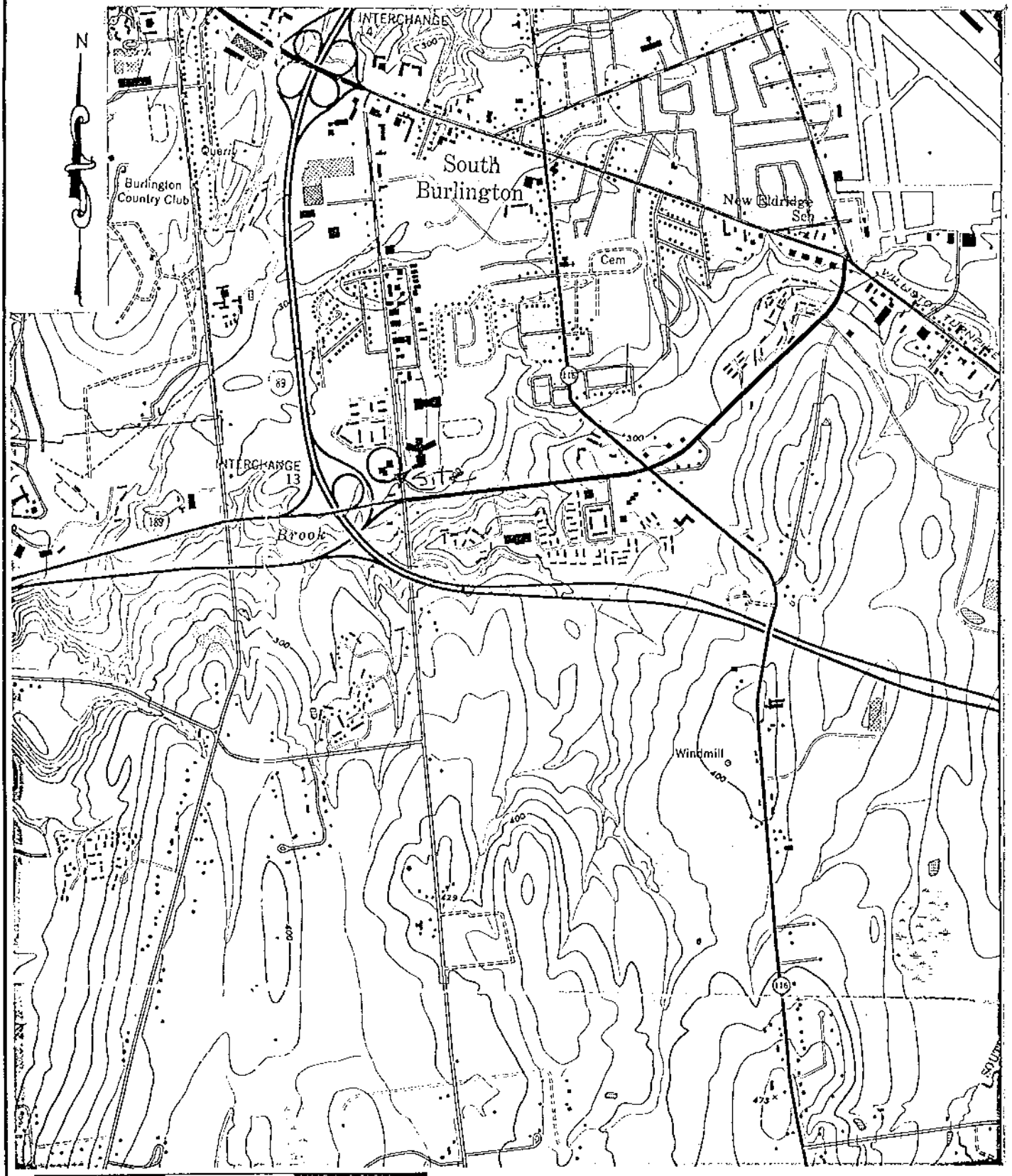
BURLINGTON, VERMONT

SOUTH BURLINGTON POLICE DEPT.
575 DORSET STREET

SOUTH BURLINTON, VERMONT

SITE PLAN

DATE: 8/27/93	SCALE: 1"=50'	DRN: MRL	APPD: MC



QUAD:

South Burlington Police Dept
575 Dorset Street
South Burlington, VT

Wagner, Heindel, and Noyes

CONSULTING SCIENTISTS AND ENGINEERS

• Hydrogeology • Ecology •
• Environmental Engineering •

BURLINGTON, VERMONT

USGS TOPOGRAPHIC MAP

DATE: 8/27/93	SCALE: 1: 24000	DRN:	APPD: mc

A2, p1

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 21, 1993 Page 1

Drilling contractor: Tri-State Drilling and Boring
Drillers: Neil Faulkner and Storm Hogan
Environmental Engineer: Michele Christopher (WH&N)

MW-1
Weather: 60-70° Fahrenheit, steady rain

Sample Number	Depth	Blow Counts Per 6 Inches	Recovery in Feet	Soil Logs
S1	0 - 2' bgs	10,15,15	0.8'	0 - 2.0' Medium brown sand with pebbles - fill material, dry **Note:** Rain prevented the use of PID to determine presence of VOCs. Soil sample had no noticeable odor.
S2	2' - 4'	6,3,4,9	1.1'	0 - 1.1' Medium brown sand with pebbles - fill material, dry; gray fine sand at bottom cm of sample **Note:** Rain prevented use of PID to determine presence of VOCs Soil sample had no noticeable odor.
S3	4' - 6'	9,9,9,16	1.4'	0- 0.3' Gray, fine sand, dry. 0.3' - 0.7' Medium brown fine sand, dry. 0.7' - 1.4' Light brown fine sand, dry. **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.
S4	6' - 8'	6,6,9,13	1.2'	0 - 0.65' Light brown fine sand, dry. 0.65' - 1.2' Medium brown fine sand, dry. **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 21, 1993

S5	8' - 10'	6,6,7,8	1.1'	0 - 0.6' Wet fine sand 0.6' - 1.1' Saturated sand **Note:** Soil sample was bagged and head space was analyzed for VOCs. PID = 0.0 ppm.
S6	10' - 12'	3,3,2,1	1.5'	0 - 0.9' Saturated sand 0.9' - 1.0' Saturated, very fine silty sand 1.0' - 1.5' Very dense, silty clay, clayey silt, olive-brown **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.

Monitoring Well #1 Construction Details:

- Depth of well = 15' bgs
- 0.020' factory-slotted screen from 15' - 5' with filter sock
- Sand pack from 15' - 3.5'
- Bentonite plug from 3.5' - 1.5'
- Native fill to 1.0' bgs
- 6" flush-mounted well guard installed

[sb-SBPOL1/MC 7-17-93]

A2, p3

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 21, 1993 Page 1

Drilling contractor: Tri-State Drilling and Boring
Drillers: Neil Faulkner and Storm Hogan
Environmental Engineer: Michele Christopher (WH&N)

MW-2
Weather: 60-70° Fahrenheit, steady rain

Sample Number	Depth	Blow Counts Per 6 Inches	Recovery in Feet	Soil Logs
S1	0 - 2' bgs	6,6,3,4	0.5'	Light brown sand with pebbles, dry, fill material. **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.
S2	2' - 4'	3,3,1,4	0.9'	0 - 0.9' Dry orange sand, fill material **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.
S3	4' - 6'	4,14,10,12	1.1'	0 - 0.6' Light brown, fine sand with some horizontal laminations, dry 0.6' - 1.1' Slightly damp, light brown fine sand **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.
S4	6' - 8'	6,6,7,6	1.4'	0 - 1.0' Light brown fine sand, moist. 1.0' - 1.4' Light brown, coarser fine sand, wet **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 21, 1993

S5	8' - 10'	3,4,5,3	1.6'	0 - 0.8' 0.8' - 1.5' 1.5' - 1.6'	Light brown medium fine sand, coarser, saturated. Saturated, medium brown, medium fine sand Olive-brown silty very fine sand **Note:** Soil sample was bagged and head space was analyzed using PID. PID = 0.0 ppm.
S6	10' - 12'	1,1,6,7	1.0'	0 - 0.85' 0.85' - 1.0'	Medium brown, dense, clayey silt, silty clay Dark brown-gray very fine sand and some silt **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample contained no noticeable odor.
S7	15' - 17'	1,1,2,2	2.0'	0 - 2.0'	Dense, gray, silty clay, clayey silt **Note:** Rain prevented use of PID to determine presence of VOCs. Soil sample had no noticeable odor.

Monitoring Well #2 Construction Details:

- Depth of well = 15' bgs
- 0.020' factory-slotted screen from 15' - 5' with filter sock installed from 15' - 5' bgs
- Sand pack from 15' - 3.5'
- Bentonite plug from 3.5' - 1.5'
- Native fill to 1.0' bgs
- 6" flush-mounted well guard installed

[sb-sbpo2//MC 5-27-93]

A2, p5

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 22, 1993

Drilling contractor: Tri-State Drilling and Boring
Drillers: Neil Faulkner and Storm Hogan
Environmental Engineer: Michele Christopher (WH&N)

MW-3
Weather: 60-70° Fahrenheit, sunny with some clouds

Sample Number	Depth	Blow Counts Per 6 Inches	Recovery in Feet	Soil Logs	
S1	0 - 2'	5,4,3,5	0.8'	0 - 0.8'	Sandy topsoil, dry PID = 0.0 ppm
S2	2' - 4'	3,3,3,5	1.0'	0 - 0.5' 0.5' - 0.7' 0.7' - 1.0' **Note:** PID = 0.0 ppm	Dark brown sandy topsoil, dry. Light brown sand with some silt, dry. Medium brown sand with some silt, dry.
S3	4' - 6'	10,11,11,12	1.2'	0 - 0.4' 0.4' - 1.1' 1.1' - 1.2' **Note:** PID = 0.0 ppm	Light brown fine sand with some silt, damp. Orange very fine sand, dry. Medium brown fine sand, dry.
S4	6' - 8'	6,9,7,12	1.0'	0 - 1.0'	Wet, medium brown fine sand
S5	8' - 10'	2,3,4,4	1.1'	0 - 1.1' **Note:** PID = 0.0 ppm	Saturated very fine sand with some silt, thixotropic.

SOUTH BURLINGTON - POLICE DEPARTMENT

SOIL BORING LOGS WITH MONITORING WELL DETAILS

July 22, 1993

S6	10' - 12'	1,1,2,2	0.5'	0 - 0.4' 0.4' - 0.5'	Saturated very fine sand with silt, thixotropic. Gray clayey silt, silty clay, wet.
				Note: PID = 0.0 ppm	
S7	15' - 17'		2.0'	0 - 2.0'	Gray, wet silty clay, clayey silt

Monitoring Well #3 Installation Details:

- Depth of well = 15' bgs
- 0.020' factory-slotted screen from 15' - 5' with filter sock installed from 15' - 5' bgs
- Sand pack from 15' - 3.5'
- Bentonite plug from 3.5' - 1.5'
- Native fill to 1.0' bgs
- 6" flush-mounted well guard installed

[SB-SBPO3/MC 5-27-93]

A-2, p-7

SOIL PROBE LOG

MW# 1
Police Department
So. Burlington, VT

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER Continuous
TYPE	HSA	SS
SIZE	2"	
HAMMER	140#	
FALL	30"	

SOIL
Saturated
Wet
Moist
Damp
Slightly Damp

DATE STARTED: 7/21/93 DATE COMPLETED: 7/21/93

FOOTAGE DEPTH	BLOW COUNTS 6 12 18 24	REC	DRILLER'S NOTES & COMMENTS
0-2'	10 15 15	Refusal	Dry. Fine sand gravel.
2-4'	6 3 4 9	16"	Dry. Same as above.
4-6'	9 9 9 16	18"	Dry. Medium sand in thick horizontal layer gray to brown in color.
6-8'	6 6 9 13	16"	Dry. Fine sand gray brown.
8-10'	6 6 7 8	16"	Wet. Brown fine and medium sand.
10-12'	3 3 2 1	16"	Wet. Same as above over 7" of clay silt very plastic.
			Augered to 15'.
			Screen 15' to 5' below GS.
			Riser 5' to GS.
			Sandpack 15' to 3'6" below GS.
			Bentonite 3'6" to 1'6" below GS.

Client: Police Department
Job Location: So. Burlington, VT
Engineer: Wagner, Heindel & Noyes
Burlington, VT
Inspector: Michelle Christopher

Driller: Neal Faulkner
Helper: Sean Hogan
Materials: 4 sand, 1 bentonite.

A2, p8

SOIL PROBE LOG

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

MW# 2
Police Department
So. Burlington, VT

		SAMPLER Continuous
TYPE	HSA	SS
SIZE	2"	
HAMMER	140#	
FALL	30"	

SOIL
Saturated
Wet
Moist
Damp
Slightly Damp

DATE STARTED: 7/21/93 DATE COMPLETED: 7/21/93

FOOTAGE DEPTH	BLOW COUNTS (6 12 18 24)	REC		DRILLER'S NOTES & COMMENTS
0-2'	6 6 3 4	.4"	Dry.	Fine sandy gravel brown in color.
2-4'	3 3 1 4	17"	Dry.	Same as above over 10" of red brown fine sand.
4-6'	4 14 10 12	16"	Dry.	Gray brown fine sand some orange stain slightly damp near bottom.
6-8'	6 6 7 6	18"	Damp.	Light red brown fine sand over 2" of coarse snad saturated.
8-10'	3 4 5 3	20"	Wet.	Medium and coarse sand over 1" of silt.
10-12'	1 1 6 7	12"	Wet.	Clay silt over 5" of very fine sand.
15-17'	1 1 2 2	...	Wet.	Clay silt.
				Screen 15' to 5' below GS.
				Riser 5' to GS.
				Sandpack 15' to 3'6" below GS.
				Bentonite 3'6" to 1'6" below GS.

Client: Patchen Road
Job Location: So. Burlington, VT
Engineer: Wagner, Heindel & Noyes
Burlington, VT
Inspector: Michelle Christopher

Driller: Neal Faulkner
Helper: Sean Hogan
Materials: 4 sand, 1 bentonite.

A2, p9

SOIL PROBE LOG

MW# 3
Police Department
So. Burlington, VT

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER Continuous
TYPE	HSA	SS
SIZE	2"	
HAMMER	140#	
FALL	30"	

SOIL
Saturated
Wet
Moist
Damp
Slightly Damp

DATE STARTED: 7/22/93 DATE COMPLETED: 7/22/93

FOOTAGE DEPTH	BLOW COUNTS 6 12 18 24	REC	DRILLER'S NOTES & COMMENTS
0-2'	5 4 3 5	14" Dry.	Sandy topsoil.
2-4'	3 3 3 5	20" Dry.	Sandy fine gravel over 6" of sandy topsoil over 6" of gray fine sand..
4-6'	10 11 11 12	22" Damp.	Fine to medium sand with thin silt lenses red brown and gray in color.
6-8'	6 9 7 12	18" Wet.	Red brown fine to medium sand.
8-10'	2 3 4 4	16" Wet.	Olive brown very fine sand some silt.
10-12'	1 1 2 2	4" Wet.	Gray blue silt.
15-17'	2 2 2 2	Wet.	Same as above.

Client: Patchen Road
Job Location: So. Burlington, VT
Engineer: Wagner, Heindel & Noyes
Burlington, VT
Inspector: Michelle Christopher

Driller: Neal Faulkner
Helper: Sean Hogan
Materials: 4 sand, 1 bentonite.

A3, p1

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993

PROJECT CODE: HNSB1932
REF.#: 49,370 - 49,374

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated preservation with NaN_3.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

A3, p8

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,370
STATION: Trip Blank
TIME SAMPLED: 7:30
SAMPLER: C. Aldrich

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 100%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

A3, p3

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,371
STATION: MW 1
TIME SAMPLED: 8:40
SAMPLER: C. Aldrich

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 99%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

A3 p4

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,372
STATION: MW 2
TIME SAMPLED: 9:30
SAMPLER: C. Aldrich

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 122%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

A3, p5

ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,373
STATION: MW 3
TIME SAMPLED: 9:00
SAMPLER: C. Aldrich

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 95%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

A3, p6

ENDYNE, INC.

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LABORATORY REPORT

EPA METHOD 8020 -- PURGEABLE AROMATICS

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,374
STATION: Field Blank
TIME SAMPLED: 10:00
SAMPLER: C. Aldrich

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 104%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

A3,p1

ENDYNE, INC.

Laboratory Services

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(802) 879-4333
FAX 879-7103

EPA METHOD 8020 LABORATORY REPORT

MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Wagner, Heindel, and Noyes, Inc.
PROJECT NAME: South Burlington Police Dept
REPORT DATE: August 12, 1993
DATE SAMPLED: August 2, 1993
DATE RECEIVED: August 2, 1993
ANALYSIS DATE: August 11, 1993

PROJECT CODE: HNSB1932
REF.#: 49,374
STATION: Field Blank
TIME SAMPLED: 10:00
SAMPLER: C. Aldrich

Parameter	Sample(ug/L)	Spike(ug/L)	Dup1(ug/L	Dup2(ug/L)	Avg % Rec
Benzene	ND[1]	10	10.0	10.5	103%
Toluene	ND	10	11.5	12.2	119%
Ethylbenzene	ND	10	10.1	11.0	106%
Xylenes	ND	30	38.9	37.3	127%

NOTES:
1 None detected

A3, p6

ENDYNE, INC.

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333

007821

CHAIN-OF-CUSTODY RECORD

Project Name: South Burlington Police Dept. Site Location: So Burl. VT	Reporting Address: WHN	Billing Address: WHN
Endyne Project Number: H05B142.2	Company: WHN Contact Name/Phone #: M. Christopher 658 0820	Sampler Name: C. Aldrich Phone #: 658-0820

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 8/2/93	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
4,32	~~4H0053~~	Trip Blank	H_2O	✓	7^{30}A	2	40mL		8020	HgN_3	
4311	4H1068	MW 1	↓	↓	8:40	↓	↓		↓	↓	
4312	4H1055	MW 2			9:30						
4313	4H1056	MW 3			9:00						
4314	4H1057	Field Blank	↓	↓	10:00	↓	↓		↓	↓	

Relinquished by: Signature: Chris Aldrich	Received by: Signature: J M Kelly	Date/Time: 8/2/93 10:35 AM
Relinquished by: Signature	Received by: Signature	Date/Time

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										